PARADYNE®

BSX8000-5 Broadband Services Switch
Installation Instructions

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BSX8000-5 Overview

The BSX8000-5 Broadband Services Switch provides multi-gigabit Ethernet uplink support capability, full-nonblocking switching throughput, and enhanced management functionality for the 4000E and 12000E Broadband Loop Carriers (BLCs).

The BSX8000-5 supports four fixed 10/100/1000 RJ45 Ethernet interfaces and one MIM (Micro Interface Module) slot. Multiple MIM varieties are supported.

The BSX8000-5 delivers a full 1 Gbps full duplex backplane connection to each access module in the BLC. This ensures that the aggregate access bandwidth cannot exceed the backplane speed of the chassis. When two BSX8000 modules are used in the 12000E, the backplane speed is doubled, providing a 2 Gbps connection to each access module.

The BSX8000-5 supports the following access modules:

- AAM8000-24
- AIM24000-48
- EIM2000-12
- EIM2000-24
- SIM2000-24
- TIM1500-12
- TIM1500-24

The BSX8000-5 supports 576 DSL ports.

Product Documentation Online

Complete documentation for Paradyne products is available at **www.paradyne.com**. Select *Support* → *Technical Manuals*.

To order a paper copy of a Paradyne document, or to speak with a sales representative, please call 1-727-530-2000.

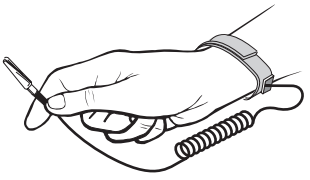
Release Notes

Release notes for this product are available in the subscriber firmware area of **www.paradyne.com**. Select *Support* → *Subscriber Firmware*.

Always review the relevant release notes before installing a new card.

Unpacking and Inspecting the Equipment

HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES



This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

If there is any visible damage, do not attempt to connect the device. Contact your sales or support representative

Installing a Micro Interface Module (MIM) in the BSX8000-5

A MIM provides the upstream network connection for the BLC. Any of Paradyne's available MIM models may be installed on the BSX8000-5 uplink module.

Procedure

1. Remove the cover plate from the MIM port.

   CAUTION: Cover plates should be stored for possible future use. If a MIM is removed from a BSX8000-5, it must be replaced with either another MIM or a cover plate. Do not operate a BSX8000-5 with an open MIM port.

2. Carefully slide the faceplate of the MIM into the BSX8000-5 uplink module faceplate. Ensure that the mounting holes on the MIM are lined up with the BSX8000-5 uplink module.

3. Secure the MIM circuit board to the BSX8000-5 uplink module with the two thumbscrews.

Installing the BSX8000-5 in a BLC

The 12000E is a 14-slot Broadband Loop Carrier (BLC). Slots 1–12 are reserved for access modules (such as the AIM24000-48) and slots U1 and U2 are reserved for uplink modules. Although not required for operational purposes, if redundancy is desired, two BSX8000-5 modules may be installed in the 12000E, in slots U1 and U2. (Note: For redundancy, the two uplink modules in the chassis must be identical models.)

The 4000E is a five-slot BLC. Slots 1–4 are reserved for access modules and slot U1 is reserved for a single uplink module.

▶ Procedure

1. Align the BSX8000-5 uplink module with the slot module guides of the chosen slot for installation (either slot U1 or U2 on the 12000E or slot U1 on the 4000E).
2. Slide the BSX8000-5 uplink module into the chassis. Do not use excessive force.
3. Tighten the fastening screws on the BSX8000-5 uplink module faceplate.
4. Verify that the PWR (Power) LED on the BSX8000-5 faceplate is illuminated.

Connect the MIM to the Network

Connect to the core network by using one of the fixed GigE interfaces or by using an interface from the added MIM. See *10/100/1000BaseT Connectors* on page 14.

MIM-10/100

Plug your Ethernet cable into the RJ45 Ethernet port on the MIM-10/100 faceplate. The MIM-10/100 connects to a router or a PC with a straight-through cable and to a hub or a switch with a crossover cable.

Verify the connection: solid illumination of the Lnk (link) LED on the MIM-10/100 faceplate indicates an Ethernet uplink connection has been established. The MIM-10/100 Ethernet port is 10/100 auto-negotiating.

NOTE: Configure the remote device with which you are connecting to auto-negotiate (if applicable) prior to establishing your Ethernet connection.

MIM100F

Plug your Ethernet Fiber Optic Cable into the port on the MIM100F faceplate.

MIM-2000F

The MIM-2000F is a two-port fiber gigabit Ethernet interface, which connects to the Fast Ethernet Bus of the BLC. This will function but is not recommended for use with the BSX8000-5 Uplink Interface.

MIM-4000F

The MIM-4000F is a four-port fiber gigabit Ethernet interface connecting directly to the gigabit Ethernet switch in the BSX8000-5 uplink module.

MIM-2E1 or MIM-4E1

Plug your E1 cable into one of the RJ45 E1 ports on the MIM faceplate. The MIM-2E1 or MIM-4E1 connects to an E1 network extender provider unit, or an interface module in another BLC, via a standard E1 line.

Verify the connection: the Lnk (link) LED on the MIM faceplate flashes green to indicate a network connection has been established.

MIM-2T1 or MIM-4T1

Plug your T1 cable into one of the RJ45 T1 ports on the MIM faceplate. The MIM-2T1 or MIM-4T1 connects to a T1 network extender provider unit, or an interface module in another BLC, via a standard T1 line.

Verify the connection: the Lnk (link) LED on the MIM faceplate flashes green to indicate a network connection has been established.

BLC Management

The BSX8000-5 uplink module provides BLC management capability via the Command Line Interface (CLI), Simple Network Management Protocol (SNMP), and the web-based Network Management System (NMS).

Web Interface (NMS)

The following are required for use of the NMS:

- **Web Browser** – Required for running NMS. Compatible web browsers include, but are not limited to, Microsoft Internet Explorer (version 6.0 or higher) and Netscape Navigator (version 6.0 or higher). NMS is optimized for use with Internet Explorer.
- Use your browser's default settings when running NMS. JavaScript must be enabled.
- Screen Resolution – 1024 x 768 pixels is the minimum resolution required for all NMS views to fit within the dimensions of most monitors and laptops. Lower screen resolutions (such as 800 x 600 pixels) may cause NMS screens to exceed the width or height of the screen. To verify screen resolution on a Windows system:
  - — Right click on your desktop
  - — Select Properties
  - — Click the Settings tab
  - — Adjust the Screen Resolution as needed

Configuring Your Windows PC to Communicate with NMS

To communicate with NMS, your PC's Ethernet interface must be on the same subnet as the BSX8000-5. For example, to configure the IP address under Windows XP:

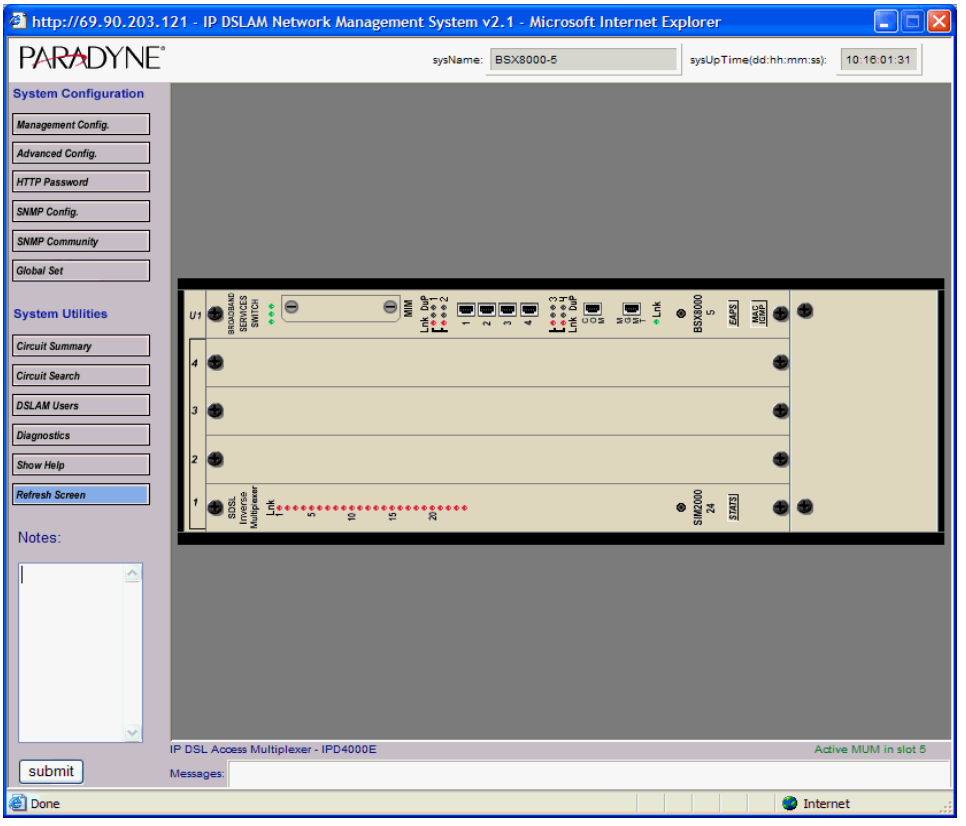
▶ Procedure

1. In the Windows task bar, click on the Start button, and then click on Control Panel.
2. Double-click on the Network Connections icon.
3. In the LAN or High-Speed Internet window, right-click on the icon corresponding to your network interface card (NIC) and select Properties. (Often this icon is labeled Local Area Connection.) The Local Area Connection dialog box is displayed with a list of currently installed network items.
4. Ensure that the check box to the left of the item labeled Internet Protocol (TCP/IP) is checked, and click on Properties.
5. Write down the current IP Address and Subnet Mask in the Internet Protocol (TCP/IP) Properties dialog box. When you are done using NMS, you will need to reconfigure your PC with these values.
6. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled "Use the following IP address" and type 192.168.254.x (where x is any number between 3 and 250, inclusive) in the IP Address field.
7. Type 255.255.255.0 in the Subnet Mask field.
8. Click on OK twice to confirm your changes, and close the Control Panel.
9. Start your web browser. Type the default IP address into the Address field and press Enter. The default IP address of a BSX8000-5 in Slot 13 of a 12000E BLC or Slot 5 of a 4000E BLC is 192.168.254.252. The default IP address of a BSX8000-5 in Slot 14 of a 12000E BLC is 192.168.254.253.

   The web server opening screen appears.
10. Click on >> Next >>. The login dialog box appears. Log in using:

Username:	superuser
Password:	Password

The NMS home page appears.



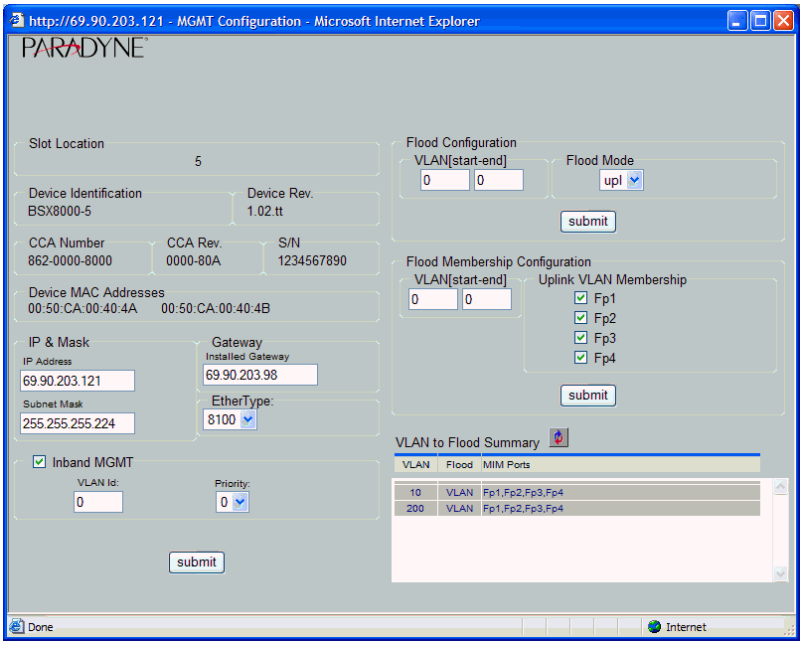
NMS Management Configuration

Use the Management Configuration screen to set the unit's IP address and other management parameters.

▶ Procedure

To configure management parameters:

1. From the home screen, click on the Management Config button. The Management Configuration screen appears.



2. Select or enter the following parameters:

Parameter	Description
IP Address	Specify the management IP address for the DSLAM.
Subnet Mask	Specify the subnet mask for the IP address.
Gateway	Specify the first-hop gateway address.
EtherType	Select the type of packets supported by your router. This is used only for backbone VLAN (Q in Q) traffic.
Inband MGMT	Check this box if you will use inband management (that is, you will allow the device to be contacted by ports other than the MGMT port)..
VLAN Id	Specify a VLAN identifier for inband management.
Priority	Specify a priority (0–7) for inband management traffic.

Parameter	Description
Flood Configuration	Flood refers to the method in which interface modules handle unknown unicasts, unknown broadcasts, and unknown multicasts for each port. ■ Uplink – Any traffic with VLAN IDs that match a VLAN ID that has been configured to Uplink flood (default) will be allowed to flow from DSL ports to uplinks only (not DSL port to DSL port). ■ VLAN – Any traffic with VLAN IDs that match a VLAN ID that has been configured to VLAN flood will be allowed to flow from DSL port to uplinks and DSL port to DSL port.
Flood Membership Configuration	Specify the VLAN membership of the uplink ports (four fixed ports and any MIM ports). By default all uplinks are members of all VLANs. However you can change it such that an uplink port is a member of only a certain set of VLAN IDs. In this case any ingress or egress traffic on an uplink port with a VLAN ID that the uplink port is not a member of, will be dropped.

3. Click on Submit.

Command Line Interface (CLI)

CLI System Requirements

- **Straight-Through RJ45 to RJ45 Ethernet Cable –** Required for establishing a direct connection from the COM port to a DB9 adapter.
- **DB9 Female to RJ45 Male Adapter –** Required for conversion of your PC's RS232 serial port for use with the RJ45 to RJ45 Ethernet cable.
- **Terminal Emulation Program –** Required for running the CLI over a direct connection. The program must emulate a VT100 terminal.
- **Telnet Client –** Required for remote management with the CLI. Microsoft Windows Operating Systems (98, 2000, NT, and XP) include a Telnet client which is executed using the Windows command prompt (cmd.exe). If you are using an operating system other than Windows, you may need to install a Telnet client.

Connecting a PC Directly

To connect a PC directly to the DSLAM to use the CLI:

▶ Procedure

1. Plug a DB9 to RJ45 adapter into the RS232 serial port on your PC. See *DB9 to RJ45 Adapter Pinouts* on page 14.
2. Connect one end of a straight-through RJ45 to RJ45 Ethernet cable into the adapter plugged into your PC, and the other end of the cable into the COM port on the face of the BSX8000-5.

Launching the Terminal Emulation Program

Launch the terminal emulation program on your PC and configure the program settings. Actual configurations will depend upon the program being used, though settings should be modeled after the list below; most are standard defaults. Refer to your terminal emulation program's user manual for further information.

Baud:	9600	Port:	Com 1
Data Bits:	8	Stop Bits:	1
Flow Control:	none	Transmit Delay:	n/a
Parity:	none		

Logging Into the CLI

Once your terminal emulation program has been launched, device information is displayed, followed by a request for username and password. You must log in as a superuser in order to make configuration changes.

Username: superuser
Password: Password

After you have logged in, enter a question mark (?) to list the available commands.

CLI Commands

The CLI supports the following commands:

Table 1. CLI Commands (1 of 2)

Command	Description
?	Lists available commands and their syntax.
ALLOW	Controls by IP address those hosts for which traffic is permitted on the DSLAM. ALL (the default) permits all traffic. Syntax: allow [ALL, IP_ADDRESS [IP address]]

Table 1. CLI Commands (2 of 2)

Command	Description
CLEAR_NVRAM	If no interface modules are present in the chassis, clears Non-Volatile Random Access Memory, restoring the DSLAM to factory defaults.
DISABLE_TELNET	Disables access to the DSLAM using Telnet.
DISABLE_TFTP	Disables access to the DSLAM using Trivial File Transfer Protocol.
DISABLE_WEB_SERVER]	Disables access to the DSLAM using the web server.
ENABLE_TELNET	Enables access to the DSLAM using Telnet.
ENABLE_TFTP	Enables access to the DSLAM using Trivial File Transfer Protocol.
ENABLE_WEB_SERVER	Enables access to the DSLAM using the web server.
HELP	Lists available commands and their syntax.
LOGOUT	Ends the CLI session.
SET	Sets a configuration option. Most SET commands require that slot be specified, and allow port optionally to be specified. Exceptions are the two system SET commands for session timeout and system name. Syntax: set cli_session_timeout *seconds* set system_name *name* set slot 1 [[port] [all, *port_number*]] [item] [value] Items and values for SET commands are shown in the CLI help.
SHOW	Shows a configuration option. SHOW commands require that slot be specified, and allow port optionally to be specified. Syntax: show slot 1 [[port] [all, *port_number*]] [item] [value] Items and values for SHOW commands are shown in the CLI help.
WHO	Shows who is logged in the system.

LED Indicators

Table 2. LED States and Meanings

LED	State	Indication	Additional Information
PWR (Power)	Solid green	BSX8000-5 uplink module is receiving power	Both BLC power terminals are connected.
	Solid amber	BSX8000-5 uplink module is receiving power	Only one of the BLC power terminals is connected.
	No illumination	No power	The BSX8000-5 uplink module is not receiving power (the BLC may or may not be receiving power).
OK	Pulsing green*	BSX8000-5 uplink module is operational	
Fan	Solid green	All fans are functioning	All four of the fans on the BLC fan card are functioning.
	Solid amber	Non-functioning fan	At least one of the four fans on the BLC fan card is no longer functioning.
Lnk (Link) Uplink Ports and MGMT	Solid green	GigE link established	The MGMT port does not support GigE.
	Solid amber	Link established at 10 or 100 Mbps	
	No illumination	No link is established	
Act (Activity) Uplink Ports and MGMT	Flashing green*	Traffic flowing on link	
Dup (Duplex) Uplink Ports and MGMT	Solid green	Full duplex mode	
	No illumination	Half duplex mode	
[MIM] Lnk (Link)	Solid green	MIM-10/100, MIM100F, MIM-2000F, or MIM-4000F uplink connection is established	For further information regarding MIM LEDs, please refer to the corresponding MIM Installation Instructions.
	Flashing green*	MIM-2T1 MIM-4T1, MIM-2E1, or MIM-4E1 uplink connection is established	For further information regarding MIM LEDs, refer to the corresponding MIM Installation Instructions.
	No illumination	No uplink connection is established	Applicable to all MIM model types.

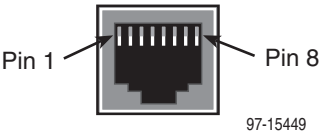
* A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

10/100/1000BaseT Connectors

The uplink ports are 8-pin unkeyed modular jacks for a 10/100/1000BaseT interface. The MGMT port is an 8-pin modular jack supporting 10/100BaseT.

Table 3. 10/100/1000 Pinouts

Signal	Pin
Transmitted Data +	1
Transmitted Data –	2
Received Data +	3
Unused	4
Unused	5
Received Data –	6
Unused	7
Unused	8



DB9 to RJ45 Adapter Pinouts

To connect the COM port to the DB9 serial port of a PC, use an adapter wired as shown:

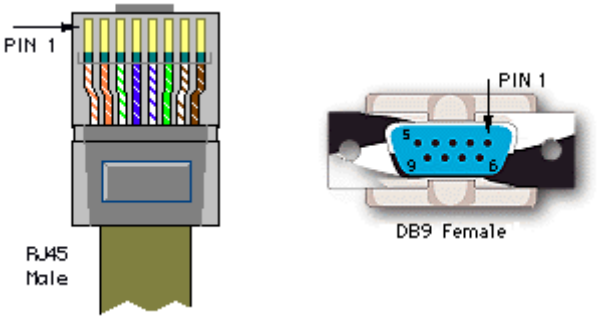


Table 4. DB9 to RJ45 Adapter Pinouts

Pin	RJ45 Port		Direction	PC RS232 Serial Port		Pin
1	Transmit Data	TxD	→	RxD	Receive Data	2
2	Data Set Ready	DSR	←	RTS	Request to Send	7
4	Receive Data	RxD	←	TxD	Transmit Data	3
5	Ground	GND	↔	GND	Ground	5
6	Data Terminal Ready	DTR	→	CTS	Clear to Send	8

Pins not shown are unused.

Regulatory Compliance for Class A Equipment

The following regulatory compliance information applies to a BSX8000-5 as installed in a Paradyne BLC.

US Federal Communications Commission (FCC)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

Europe

This Class A product complies with European Norm EN55022.

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct the situation.

Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at **www.paradyne.com**. (Be sure to register your warranty at **www.paradyne.com/warranty**.)
- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — Outside the U.S.A., call 1-727-530-2340

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